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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/791,084
Filing Date: March 02, 2004
Appellant(s): STEIGERWALD ET AL.

Kevin L. Daffer
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on February 27, 2008, appealing from the Office action mailed July 06, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,411,261	Lilly	06-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-9 and 24-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-9 and 24-27 are vague and indefinite because a carrier frequency of a signal transmitted is unknown. Therefore the wavelength (C/f) of the transmitted signal is unknown. Thus the length of the apparatus is unknown. Therefore, the method for forming an apparatus cannot be carried out because the exact or range of length of the apparatus is unknown prior to forming the apparatus.

Claims 1-9, 24 and 26-27, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6,411,261 to Lilly.

Regarding claim 1, Lilly discloses a method for forming an apparatus (100, see Fig. 2B) configured to reduce electromagnetic interference between a pair of antennas coupled to a wireless communication device (See Col. 1, lines 37-40 and Col. 3, lines 50-57), the method comprises: extracting a shape of the apparatus from a thin sheet of conductive material (104, 304, 804; etc.); folding the shape into a plurality of resonant circuit elements (see Figs. 10-12), each configured to resonate at or near a carrier frequency of a signal transmitted by only one of the pair of antennas (see Col. 1, lines 28-32); and wherein by the steps of extracting and folding, the apparatus is formed having a length substantially equal to one-half of the transmitted signal wavelength (the height of the apparatus is about 0.005λ to 0.05λ as disclosed in Col. 4, lines 45-

47 and Fig. 10 shows the length (x) of the apparatus is about 14 times the height (y) of the apparatus, see the attachment of the annotation of Fig. 10). Therefore the length of the apparatus is about 0.07λ to 0.7λ that includes the length of the apparatus as claimed in the present claim invention). Note that each of the folded elements as shown in Fig. 2B of Lilly is as broadly as readable as a resonant circuit element as claimed by present application since it has the same configuration as Fig. 7D of application.

Regarding claims 2-5, Lilly discloses the thin sheet of conductive material comprises a metal selected from a group comprising iron (Fe), copper (Cu), gold (Au), silver (Ag), tin (Son), and nickel (Ni), or a metal alloy selected from a group comprising beryllium copper (Beck), phosphor bronze (Ph+Cu/Zn/Sn), magnesium alloys (Mg/Al/O) and steel (Fe/C) and a primarily ferrous-based material is stamping and laser or chemical etching (See, Col. 4, lines 24-32). Note that since Lilly disclose the same the conductive material for forming the apparatus as claimed above. Therefore, it is inherently comprised a relative permittivity value of about 0.0 F/m to about 1.0 F/m and a relative permeability value of about 10 H/m to about 100,000 H/m.

Regarding claim 6, Lilly discloses the plurality of resonant circuit elements comprise a plurality of rectangular elements (1034 or 1134 see Figs. 10-11) connected to and arranged above a common reference plane (1004 or 1104) by a plurality of vertical segments (1006 or 1106).

Regarding claim 7, Lilly discloses a dielectric material (514) between the plurality of rectangular elements and the common reference plane.

Regarding claims 8-9 and 24, Lilly discloses the plurality of resonant circuit elements include A-shaped elements (see Fig. 7), further related Figs. 8-12 show a plurality of relatively

long domed elements spaced apart by a plurality of relatively thin slots and arranging a dielectric material within the relatively thin slots between the pluralities of relatively long domed elements (see Col. 7, lines 13-14).

Regarding claim 26, Lilly discloses the plurality of resonant circuit elements having a periodic surface (1034) that is less than or equal to one-tenth of the transmitted signal wavelength (the height of the apparatus is about 0.005λ to 0.05λ as disclosed in Col. 4, lines 45-47 and Fig. 10 shows a periodic surface 1034 is about the same or less than the height of the apparatus).

Regarding claim 27, Lilly discloses the apparatus is formed without a dielectric substrate (see Fig. 2B).

Claims 1-9 and 24-27, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Lilly.

Regarding claim 1, if Applicants argue that Lilly does not teach the apparatus is formed having a length substantially equal to one-half of the transmitted signal wavelength then it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the apparatus having a length substantially equal to one-half of the transmitted signal wavelength, sine it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Alller,* 105 USPQ 233.

Regarding claims 2-9, 24 and 26-27, see the rejection provided above.

Regarding claim 25, Lilly does not disclose the thin sheet of conductive material is selected from a range of thicknesses comprising about 0.1 mm to about 0.2 mm. It would have been an obvious matter of design choice to one having ordinary skill in the art at the time the invention was made to choose the thin sheet of conductive having any thickness level such as about 0.1 mm to about 0.2 mm, since applicants have not disclosed the specific thickness of about 0.1 mm to about 0.2 mm for the thin sheet of conductive material, would solve any stated problem or for any particular purpose and it appears that the invention would perform well with the thin sheet of conductive material thickness as disclosed by Lilly.

(10) Response to Argument

ISSUE 1: Claim 1-9 and 24-27 are rejected under 35 U.S.C. § 112, second paragraph.

Appellants argue in the appeal brief that "The present claim provides a reasonable degree of clarity and precision by simply stating that 'the apparatus is formed having a length substantially equal to one-half of the transmitted signal wavelength.'" The Examiner disagrees because the present claim does not particularly point out and distinctly define the metes and bounds of the subject matter for which protection is sought. A skilled artisan simply would not be able to form an apparatus having unknown dimension/size (i.e. length).

Appellants argue that "the apparatus length is not unknown" because claim 1 cites the limitation of: "the apparatus is formed having a length substantially equal to one-half of the transmitted signal wavelength". The Examiner disagrees because the cited limitation does not provide a reasonable degree of clarity and particularity since it does not provide the

actual/predetermined length of the apparatus. It only defines the length of the apparatus which is substantially equal to one-half of the transmitted signal wavelength. However, the wavelength of transmitted signal is unknown. Nowhere in the claims recites a value of the transmitted signal wavelength. Since the transmitted signal wavelength is not known, thus the length of the apparatus is not known; and without the predetermined length of apparatus, one ordinary skill in the art cannot build such apparatus as admitted by appellant that "the desired wavelength would be known beforehand, for enabling the apparatus to be formed with an appropriate length" (see "Appeal Brief" page 5, 4th paragraph). Therefore, the claim invention is vague and indefinite because the actual/predetermine length of the apparatus or transmitted signal wavelength is not known.

Appellants' arguments are invalid by pointing to the specification for examples of possible apparatus lengths to indicate the claims are not vague and indefinite and to define the metes and bound of the claim subject matter. First, although the different values (range of values) of the length of the apparatus are found as examples in the specification, they are not claimed explicitly in the claims. Briefly, the disclosed examples encompass a wide range of lengths. Appellants reply on the examples disclosed on page 33, lines 10-26 to show one possible apparatus length which is about 62 mm (see "Appeal Brief" page 5, last paragraph). However, reviewing the above disclosure in page 33, lines 19-22 define a wide range of possible lengths 50-260 mm for the apparatus. One of ordinary skill in the art would not know which length of the apparatus, "the metes and bounds of the subject matter", that appellants seek for protection. Second, the specification discloses the length of the apparatus is preferably about

one-half of the longest wavelength (i.e. shortest frequency) used by radio modules (see page 33, lines 21-23 of the Specification, emphasis added) and the band-gap frequency range 900 may continuously extend between about 2.4 GHz and 7.2-9.6 GHz (Specification page 38, lines 13-14). This is a wide range of transmitted frequencies. With this wide range of possible transmitted frequencies or "wavelengths", one ordinary skill in the art would not known how to extract a shape of the apparatus and fold the shape into a plurality of resonant circuit elements to form the apparatus having length that is substantially about one-half of the transmitted signal wavelength. Third, pointing out the possible apparatus lengths cited in the specification add nothing to the claim limitations. Since the possible apparatus lengths are not recited in the claims, pointing out the possible apparatus lengths in the specification does not set the metes and bounds of the subject matter of the claim invention.

ISSUE 2: Claim 1-9, 24 and 26-27 are rejected under 35 U.S.C. § 102(b).

Appellants argue that "Lilly fails to anticipate a method for forming an apparatus in which a length of the apparatus is substantially equal to one-half of a transmitted signal wavelength". The Examiner disagrees because Lilly discloses the apparatus (100 or 1000, see Figs. 1 and 10) having the length that is substantially equal to one-half of a transmitted signal wavelength. Lilly discloses the post (106, 1006) has a length of 0.005-0.05 of the transmitted signal wavelength (see Col. 4, lines 45-47). Since the post (106, 1006) is stamped out of the metal sheet (104, 1004), the size/dimension (i.e. length and width) of the post is corresponded to the size/dimension (i.e. length and width) of the slot (108, 1008) in the metal sheet. Therefore, the height of the post is correspondent to the width and length of the metal sheet; and the length

of the apparatus (100, 1000) is the length of the metal sheet (104, 1004). As shown in Figs. 1 and 10, the length of the metal sheet (104, 1004) is about 12-14 times longer than the length of the post (106, 1006), therefore, the length of the metal sheet (104, 1004), "apparatus" (100 and 1000), is equal to (the length of the post) x (the times of the length of the metal sheet over the length of the post), i.e. (0.005 λ * 12) to (0.05 λ * 14) or 0.06 λ to 0.7 λ. Thus, Lilly discloses the length of the apparatus is from 0.06 to 0.7 of the transmitted signal wavelength which met the limitation ("substantially equal to one-half of a transmitted signal wavelength") as recited in the present claim invention. Furthermore, since Lilly's apparatus having a certain length, it's capable of operating at the transmitted signal wavelength that is double the length of the apparatus.

Appellants argue that "Lilly fails to mention desirability, or even a possibility, for maximizing interference reduction between a pair of antennas by providing an apparatus, which is capable of scattering approximately half of the radiated energy in one direction, while the other half is scattered in a substantially opposite direction. As such, Lilly cannot be relied upon to anticipate an apparatus, whose length is uniquely configured for scattering radiated energy in such a manner." The Examiner disagrees because Lilly discloses every limitations of a method for forming an apparatus as claimed therefore, it capable of perform the intended use.

Appellant argue that "the Examiner made a mistake by used the height (0.005 λ to 0.05 λ) disclosed for the apparatus 100 shown in Figs. 2A-2B to calculate an alleged length for the apparatus 1000 shown in Fig. 10. However, these apparatuses (100, 1000) represent different

embodiments formed in different manners. It is unreasonable to assume that the height of one apparatus could be used to calculate the length of another." The Examiner disagrees because Lilly discloses (at least in Fig. 1 and its description in Col. 4, lines 45-47) the length of the apparatus (post plane 104) is about 12 times the height of the post (106), that is 0.005 λ * 12 = 0.06 λ to 0.05 λ * 12 = 0.6 λ, which met the limitation half wavelength of the present claim invention. Appellants are correct that Lilly discloses multiple different apparatus; however, the relationship between the height of the post (106, 1006) and the post plane (104, 1004) is unchanged because the length of the post is equal to the length of the slot (108, 1008) in the post plane.

Appellants argue that the measurement of drawing features are of little value when the reference does not disclose that the drawings are to scale and is silent as to dimensions and Lilly's specifically states that the "components in the figures are not necessarily to scale" (col. 2, lines 54-55). The Examiner agrees that Lilly's apparatus are not drawn to the actual scale of the apparatus; however, since the post (106, 1006) is extracted from the post plane, the length of the post (106, 1006) is equal to the length of the slot (108, 1008) which defines the length and width of the metal sheet (104, 1004). Therefore, the sizes of the post and the metal sheet are drawn to scale.

In addition, Appellants use "the period of the posts are relied upon, instead of the height, a person could calculate an alleged length of about 5*(0.02 λ) = 0.10 λ to about 5*(0.05L/2) = 0.125 λ. This is clearly much less than the claimed apparatus length (0.5 λ)." The Examiner

disagrees because the prior is that gap (g) between the two conductive shapes (110, see Col. 4, liens 2-6 and Figs. 1-2) and cannot be used to accurately calculate the length of the apparatus as suggested by Appellants.

Since the actual/exact length of the apparatus is not known and Lilly discloses all the forming steps to form the apparatus as recited in the claims (i.e., extracting and folding) and the apparatus formed by Lilly has certain size and shape (i.e. length), the apparatus disclosed by Lilly is inherently capable of operating at the transmitted signal wavelength that is double the length of the apparatus or any desired transmitted signal wavelengths.

ISSUE 3: Claim 1-9 and 24-27 are rejected under 35 U.S.C. § 103(a).

Appellants argue that "Lilly fails to provide teaching, suggestion or motivation for a method of forming an apparatus in which a length of substantially equal to one-half of a transmitted signal wavelength". The Examiner disagrees because Lilly discloses forming an apparatus as claimed by extracting a shape of the apparatus (100, 1000) from a thin sheet of conductive material (104, 1004); folding the shape into a plurality of resonant circuit elements (106, 1036), each configured to resonate at or near a carrier frequency of a signal transmitted by one of the pair of antennas (see Col. 1, lines 28-32); the apparatus has a certain length (see Figs. 1 and 10) and operates at certain frequency for suppressing, "reducing", interference between antennas (see Col. 1, lines 28-35). Therefore, it would have been obvious to a skilled artisan to form the apparatus having certain length i.e., substantially equal to one-half of a transmitted signal wavelength that would maximize inference reduction/suppression between pair of

antennas, since finding the optimum value or workable range of a result effective variable (i.e. length of the apparatus) involve only routine skill in the art. See *In re Aller,* 105 USPQ 223 and *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Appellants argue that the "general condition of the claim" is NOT disclosed in the cited art, discovering the optimum or workable range would involve more than routine skill in the art. The Examiner disagrees because Lilly discloses the "general condition of the claim" by disclosed the method of forming the apparatus comprising: forming an apparatus as claimed by extracting a shape of the apparatus (100, 1000) from a thin sheet of conductive material (104, 1004); folding the shape into a plurality of resonant circuit elements (106, 1036), each configured to resonate at or near a carrier frequency of a signal transmitted by one of the pair of antennas (see Col. 1, lines 28-32); the apparatus has a certain length (see Figs. 1 and 10) and operates at certain frequency for suppressing, "reducing", interference between antennas (see Col. 1, lines 28-35). With the apparatus above, one ordinary skill in the art would be able to find the optimum value or workable range of a result effective varying the length of the apparatus to find the optimum length the apparatus for maximizing interference reduction between two antennas.

Furthermore, Appellants have pointed out that "the exact wavelength and the exact apparatus length -- are not critical or essential to the practice of the invention" (see "Remarks" page 2, last three lines of an argument filed on 4/18/2007) and "the claimed apparatus may be optimized by setting the length equal to approximately one-half of the signal transmission wavelength in a preferred embodiment of the invention. However, such optimization is not

critical or essential to the practice of the invention" (see "Remarks" page 4, 1st paragraph of an argument filed on 4/18/2007) means that the apparatus has a length substantially equal to one-half of a transmitted signal wavelength is not critical or essential and an skilled artisan would be able to form an apparatus as disclosed by Lilly having desired length for maximizing interference reduction between two antennas.

For all the reasons above, it is believe that the rejection should be sustained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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